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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/939,711	08/28/2001	Yuuji Tanjo	50195.269	2733
20277 7590 06/03/2004 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			EXAMINER MERCADO, JULIAN A	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/939,711

Applicant(s)

TANJO ET AL.

Examiner

Julian Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-11, 13-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) 4-6, 12, 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8-28-07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

Claims 4, 6 and 17 are objected to because of the following informalities:

- a. In claim 4, it is suggested to change "comprises of a" to --comprises a--.
- b. In claim 6 at line 5, it is suggested to change "severally have thickness" to --each have a thickness--.
- c. In claim 17 at lines 4-5, it is suggested to change lines 4-5 to read --an active material layer formed on the collecting electrode containing a positive electrode active material--.

The examiner notes that the extent of minor informalities is not inclusive of claims 4, 6 and 17. The claims in general are replete with grammatical and idiomatic errors. Applicant is advised to consider revising the claims in more acceptable format.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 5 recites the limitation "the porosity... is lower" but fails to define a reference point for establishing a lower porosity. It appears to the examiner that the claim should recite, e.g. --than an active material layer further from the collecting electrode-- after "is lower" in line 3.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7-10, 13-17, are rejected under 35 U.S.C. 102(e) as being anticipated by Kawakami et al. (U.S. Pat. 6,432,585 B1).

At the outset, it is noted that the preamble recitation of "for a vehicle" was not given the effect of a limitation for independent claim 1. (also as applicable towards independent claim 11) The preamble appears to be only directed to the purpose or intended use of the lithium ion battery, and the additional components of the claim(s) can stand alone without depending on the preamble for completeness. Notwithstanding, the examiner notes that the lithium ion battery disclosed by Kawakami et al. pertains to use in vehicles. (col. 1 line 52 et seq., applies to independent claim 17) Regarding independent claims 1, 11 and 17, Kawakami et al. teaches a lithium ion battery comprising a positive electrode [10], a collecting electrode [100], and an active material layer [102]. (col. 9 line 32-42, Figure 1) The active material is lithium

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manganese oxide. (col. 49 line 62 et seq.) The thickness of the active material layer at 10 to 100  $\mu\text{m}$  and the particle diameter at 0.5 to 60  $\mu\text{m}$  is considered to teach the claimed thickness range of 20-80  $\mu\text{m}$  and particle diameter of 5  $\mu\text{m}$  or less, respectively, to the extent that the thickness and particle diameter disclosed by Kawakami et al. overlap therewith. (col. 9 line 32-42, col. 14 line 18-33, also applies to dependent claim 2) As to a porosity of 50% or more, Kawakami et al. disclose a "void volume" which has the same meaning as porosity at 0.10 to 0.86 (equaling 10% to 86%), thus, a porosity of 50% or more is considered shown by Kawakami et al. at least within the range of 50% to 86%. (col. 8 line 24-35, col. 9 line 7-15, also applies to dependent claim 3)

As to a concentration of electrolyte, Kawakami et al. disclose a concentration of 1 M (mol/L). (col. 50 line 17-23, applies to dependent claim 8) Elsewhere in the reference, the concentration is from 0.001 to 5 mol/L which is considered to teach the claimed range of 1.5 mol/L to 2.5 mol/L to the extent that this disclosed range overlaps therewith. (col. 22 line 10 et seq., applies to dependent claim 9) The electrolyte itself is  $\text{LiPF}_6$  and  $\text{LiBF}_4$ , disclosed by their Lewis acid counterpart ions  $\text{BF}_4^-$  and  $\text{PF}_6^-$ , *inter alia*. (col. 31 line 19-28, applies to dependent claim 10)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 4, 11, 13, 14, 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al. as applied to claims 1-3, 7-10, 13-17 above, in view of Wang et al. (U.S. Pat. 6,159,636)

The teachings of Kawakami et al. are discussed above and are applied towards dependent claims 13-16. The lithium ion battery disclosed by Kawakami et al. pertains to use in vehicles. (*ib*, applies to independent claims 11 and 17)

Regarding dependent claim 4 and independent claims 11 and 18, Kawakami et al. does not explicitly teach a plurality of active material layers. However, Wang et al. teaches a plurality, i.e. a second active material layer. (col. 4 line 43 et seq.) The skilled artisan would find obvious to employ a plurality of active material layers for reasons such as increasing the specific capacity of the battery cell. (col. 15 line 34-38)

As to the claimed "different particle diameter" in independent claim 11, it would naturally flow for the first and second active material layers to inherently have different particle diameters as claimed, absent of a showing by applicant that the claimed invention distinguishes over the reference. *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) and *In re Spada*, 15 USPQ 2d 1655 (Fed. Cir. 1990) The particle diameters are considered to be different by virtue of the active materials being dissimilar.

Regarding the thickness of the active material layers, absent of unexpected results the respective thickness of each of the plurality of active material layers is asserted as an optimizable parameter for a result-effective variable. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) See Kawakami et al. in col. 14 line 18-33, where it can be found that the thickness of an

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electrode material directly affects the charge quantity and resulting capacity of the battery electrode.

*Allowable Subject Matter*

Claim 5 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record and to the examiner's knowledge do not teach or render obvious the claimed invention regarding the porosity of an active material layer among a plurality of layers being lower closer to the collecting electrode.

Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record and to the examiner's knowledge do not teach or render obvious the claimed invention regarding the porosity of a first active material layer being 30% to 50% while the porosity of a second active material layer is 50% to 60%. By this arrangement, the porosity of the active material layer closer to the collecting electrode is lower than one further away.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. To the extent that U.S. Pat. 3,423,247 and U.S. Pat. 4,444,852 may be applicable towards dependent claims 5, 6 and 12, the prior art teachings therein are precluded from being

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used as a basis for rejection as the porosity of the active material layer closer to the collecting electrode is higher, i.e. as evident by the larger particle sizes and therefore higher void volumes.

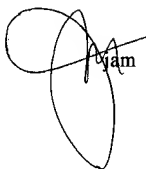
### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Julian Mercado

STEPHEN KALAFUT  
PRIMARY EXAMINER  
GROUP 1700



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